

"TEST-TUBE AGITATION DEVICE WITH CONTACTLESS OPERATION"

This invention relates to a test tube agitation device innovatively operated without contact between the test tube  
5 and the device.

Test tube agitation devices are known in the prior art and include a powered support on which the test tube to be agitated is set. To activate the agitation movement, either a manually activated switch or a microswitch arranged  
10 beneath the support and to be started by pressure of the test tube on the support is used. In the first case there is the disadvantage of having to use two hands, one to hold the test tube and the other to operate the switch, and the disadvantage of forgetting the started agitator after use.  
15 In the second case, one is required to manually exert a certain pressure on the test tube to start it with the possible risk of breaking test tubes of thinner glass and in any case with the need of a small physical effort that might in time bring a not negligible fatigue of the hand,  
20 especially in large analysis-laboratories where the same analyst performs a large number of agitations each day.

JP-A-58-191955 discloses a colorimetric analysis device comprising a rotational mixing device activated by optical sensors detecting the correct position of the test tube  
25 inside a housing where the colorimetric analysis is carried out.

The general purpose of this invention is to remedy the above mentioned shortcomings by making available an innovative test-tube agitator that does not require manual

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activation not even as forced contact between test tube and device.

In view of this purpose it was sought to provide in accordance with this invention a powered test-tube  
5 agitation device including a small plate having a rest for a test tube to be agitated and started in agitation by a

powered mechanism characterized in that the powered mechanism is operation by means of optical detection of the entry of an object into a predetermined zone above the small plate.

5 To clarify the explanation of the innovative principles of this invention and its advantages compared with the prior art there is described below with the aid of the annexed drawings a possible embodiment thereof by way of examples applying said principles. In the drawings:

10 FIG 1 shows a side elevation view of an agitator in accordance with this invention, and  
FIG 2 shows a diagrammatic perspective view of the agitator of FIG 1.

With reference to the figures, FIG 1 shows diagrammatically  
15 an agitator device designated as a whole by reference number 10 and realized in accordance with this invention.

The device includes a housing 11 on the top of which there is a plate 12 having a seat or recess 13 for receiving the bottom of a test tube 14 to be agitated. The plate 12 can  
20 be the replaceable type to be adaptable to different requirements and forms of the container to be agitated. Naturally, with the generic term 'test tube' is intended here any container usually employed or employable with agitators of the generic type to which belongs the device  
25 described here such as for example micro-test tubes, cuvettes, baking utensils, matrasses, flasks, Erlenmeyer flasks et cetera.

The plate 12 is put in agitation by a purposeful mechanism  
15 within the device with suitable frequency and amplitude

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will to obtain predetermined and preferred first contact conditions between the test tube and the plate; for example a light starting movement of the plate before contact to bring the bottom of the test tube to the center of the seat  
5 13 before contact.

Naturally, the form and proportions of the various parts can change depending on specific requirements and preferences. The device can also include additional known systems and accessories such as connections to other  
10 equipment and laboratory data networks. Advantageously, the device can also include a main turning-off switch (not shown) to avoid inappropriate starting when not required.